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Do NBA Fans Discriminate Against Race Or Nationality?

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DO NBA FANS DISCRIMINATE AGAINST RACE OR NATIONALITY? A CONTEMPORARY ANALYSIS OF CUSTOMER DISCRIMINATION

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BY
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Table of Contents

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Abstract

Previous work found evidence that the racial composition of NBA teams was positively correlated with the racial composition of their metropolitan market areas during the 1990s. This paper finds continued evidence of this relationship in the 2000s, with an accompanying attendance boost from the incorporation of white players on teams located in whiter areas. There is also evidence that white players receive a salary premium relative to black players of equal performance quality. An examination of player performance indicates that demand for foreign players with the skill set of a forward or center is higher than demand for players of equal quality from the U.S. However, an analysis of salary discrimination related to foreign players produced no conclusive evidence.

I. Introduction

Becker's concept of racial discrimination by customers argues that people often increase the cost of a transaction in their mind if it is with a minority that they discriminate against. His theory also held that a more competitive market decreases discrimination. His *customer-discrimination hypothesis* suggests that if firms were able to specialize in employing minorities and offer a better product or service, such a firm could bypass discrepancy in wages etc. between equally productive blacks and whites or females and males (Becker, 1971). When applied to the framework of professional sports, this concept becomes apparent in fan preference for watching players of their own race or nationality. The customer-discrimination hypothesis implies that sport franchises will lose revenue and profits when they follow color-neutral hiring practices.

Professional basketball players in the National Basketball Association (NBA) are exposed to a level of attention and recognition that far exceeds that of the average workforce laborer. As a business that offers its customers a particularly high degree of visibility of its employees, professional basketball provides an ideal labor market in which to apply the customer-discrimination hypothesis. Prior research is consistent with the customer-discrimination hypothesis based on a variety of factors that test for discrimination in the NBA's labor market. In particular, a number of studies find the racial composition of NBA teams to be positively correlated with the racial composition of their metropolitan markets in both the 1980s (Bodvarson & Partridge, 2001; Brown, Spiro, & Keenan, 1991; Burdekin & Idson, 1991; Hoang & Rascher, 1999, Koch &

Vanderhill, 1988.) and the 1990s (Burdekin, Hossfeld & Smith, 2005). However, the number of white players has fallen significantly since the 1980s and continues to do so, raising the possibility that professional basketball teams have become indifferent to race in their hiring practices over the years. Given the high level of visibility of players and team hiring practices in the NBA, a reexamination of this trend in the new millennium could provide valuable insights into the pertinence of customer discrimination in today's economy.

After identifying the relationship between team racial composition and that of their market area for fans, the next step is to address the question of whether teams have maximized their attendance and revenues by effectively 'matching' the racial profile of their team to that of the market. While the majority of the conclusions of prior research on this topic are mixed, Burdekin, Hossfeld & Smith (2005) found that significant revenue gains accompanied the inclusion of white players on teams located in "whiter" areas during the 1990s. At the same time, they found that the revenue product of a white player increased on the margin as the number of white players in the league declined significantly. They also identify a tendency for top-performing White players to locate in cities with larger White populations. Using more recent data, this study will examine whether these three developments have carried over into the 2000s.

Recently, a new demographic phenomenon has arisen in the NBA as talent has flooded the league from overseas. At the start of the 2009-10 season, 83 international players from 36 countries and territories were on team's official rosters matching the 2006-07 season's record high (NBA.com). This trend will certainly have implications for the customer-discrimination hypothesis as it applies to the NBA because fans are

increasingly exposed to talent from around the world. Assuming that NBA teams compete for fans in their quest to increase profits and maximize owner utility, this study will apply similar tests to those used in Burdekin, Hossfeld & Smith's 2005 work to determine if customer discrimination exists for nationality characteristics. Previous work suggests that nationality characteristics will have a significant impact on team performance, after controlling for salary expenditure, only if a discriminatory wage structure exists. Pedace (2008) examined performance and wage data from 1997 to 2007 in the English Premier League using a similar market test approach. Pedace finds evidence that players from South America received slightly preferential labor market treatment and that team owners observed increased attendance with a larger presence of South American players. However, aside from this minor bias towards South American players, Pedace finds limited evidence of discrimination against nationality. This study will apply a similar analysis to the NBA to establish whether a comparable trend exists in the professional basketball market.

II. Review of Existing Literature

Gary S. Becker was one of the first economists to focus on the existence of discrimination in the market place. While discrimination was previously considered a topic within the domain of sociologists and psychologists, Beck's groundbreaking 1971 work, titled *The Economics of Discrimination*, examined the topic under the discerning eye of economic analysis, defining economic discrimination as the difference in (or ratio of) average wage rates of minority and majority workers who may be reasonably

assumed to have equal productive capacities. This concept of economic discrimination has theoretical as well as practical importance because it challenges a fundamental principle of the workings of competitive economies: that equally productive workers should receive equal wages. In the same work, Becker identifies three distinct sources of discrimination: employer prejudice, coworker preferences, and customer preferences. The first two sources, employer prejudice and coworker preferences, should largely be eliminated by a market with competitive, profit-maximizing characteristics or result in the segregation of workers between discriminating and non-discriminating employers (Becker, 1971). Within the highly competitive labor market for professional athletes, this would imply that discrimination by employers and by fellow workers should disappear in the long-run. Discrimination by customers, on the other hand, may not be eliminated by market forces, even in the long run (Nardinelli & Simon, 1990). Although it is difficult to distinguish between customer discrimination and the other market factors that affect wages and firms' hiring procedures, there is existing evidence that customer discrimination is still quite prevalent. In particular, Holzer and Ihlanfeldt (1998), examining evidence from four major metropolitan areas, find that customer discrimination remains a common occurrence, and is especially evident when employees have significant contact with their customers.

Evidence from professional sports seems to be consistent with Becker's customer-discrimination hypothesis. In particular, an abundance of literature exists comparing the racial profile of teams in professional basketball to that of their corresponding markets areas. Using data from the 1980s, a number of studies found that NBA teams situated in a market with a White-dominated demographic had a significantly larger share of White

players (Bodvarson & Partridge, 2001; Brown, Spiro, & Keenan, 1991; Burdekin & Idson, 1991; Hoang & Rascher, 1999, Koch & Vanderhill, 1988.) A number of earlier studies exhibit the same results with data from the 1970s. Burdekin, Hossfeld and Smith (2005), suggest that "the decline in the number of white players in the NBA since the 1980s raises the possibility that basketball teams have become more 'color-blind' in their hiring practices throughout the years." However, the results from their work confirm a continued evidence of this relationship in the 1990s, matching the demographic composition of a team to that of its market area (Burdekin, Hossfeld and Smith , 2005).

After attempting to re-examine the relationship between teams' demographic profiles and their corresponding market areas, it follows logically to address the question of whether teams see an accompanying attendance and revenue gain from a "match" between the races of their players to that of their market. Prior research on the topic has produced mixed results, although studies of the NBA have had the most success with this subject. Kahn and Sherer (1988), Burdekin and Idson (1991), Hoang and Rascher (1999), using data from the NBA during the 1980s, all found that a positive match between team racial composition and the racial composition of the team's SMSA area increases attendance significantly. However, two other studies, utilizing similar datasets from the NBA, found no statistical relationship between racial composition matching and team attendance (Dey, 1997; McCormick & Tollison, 2001). A re-examination of this effect by Burdekin, Hossfeld and Smith (2005) found significant attendance and revenue gains accompanying the inclusion of white players on teams that were located in whiter areas during the 1990s. Evidence from professional baseball, although sparse, has seen similar

results, suggesting that fans maintain racial preferences for players in the MLB. (Anderson & La Croix, 1991; Fort & Gill, 2000; Nardinelli & Simon, 1990).

Another common tool for identifying and measuring discrimination is the use of earnings equations estimates to examine disparities between minority and majority group wages. Using individual player salary as the dependent variable and controlling for player performance and regional market characteristics, this method has been utilized extensively in studies concerned with professional baseball and basketball, where there is a wealth of publically available, individual and team performance statistics. There exists little evidence of salary discrimination in baseball, but the results for basketball have been much more substantial. Earlier literature, controlling for player productivity and market characteristics, suggests that White players in the NBA received a salary premium of more than 10 % during the 1980s (Brown, Spiro & Keenan, 1991; Kahn & Sheer, 1988; Koch & Vander Hill, 1988; Wallace, 1988). Contemporary evidence shows mixed results. Bodvarsson & Bradstow (1999) suggest that earnings discrimination was no longer evident in the NBA during the 1990s. However, Bodvarsson & Partridge (2001), one of only a few studies to consider how the fan base in a metro area may affect salaries for different racial groups, found that Black players in two seasons (1985-1986 and 1990-1991) were paid more in areas where the Black population was higher, a finding consistent with the customer-discrimination hypothesis.

In contrast to the large amount of literature available on racial discrimination, nationality discrimination in professional sports has not seen the same amount of attention from academics. The most significant research on the topic focuses on professional soccer, which maintains a highly international labor market with

relatively few barriers restricting player movement between countries. Szymanski (2000) was one of the first to utilize a market test approach to examine discrimination at any level in professional soccer, performing an analysis of England's most-competitive professional soccer league, the English Premier League (EPL). Szymanski's market test is based on the idea that wages will tend to reflect marginal productivities in a highly competitive labor market where workers characteristics are highly visible. When applied to a top-level professional sports league, this concept suggests that team success should be largely determined by salary expenditure. Holding salary expenditure constant, the existence of a positive relationship between having players of a specific characteristic and team success would imply a certain degree of salary discrimination against players exhibiting that characteristic. Essentially, a team could pay a player from the discriminated group less than a player of a different race or nationality and maintain the same level of team success. Using panel data from the EPL from 1978 to 1993, Szymanski found that 90% of the variation in team success can be explained by variation in salary expenditures. However, when holding wages constant, he found that teams who hired black players during the seasons between 1986 and 1993 paid 5% less than non-discriminating teams to maintain the same level of team success. Applying a similar market test approach across the top five European soccer leagues, Wilson and Ying (2003) suggest that a shortage of non-domestic talent, particularly of players from South America and eastern European countries, existed during the seasons between 1997 and 2000, indicating that teams would perform better if they hired more players from these regions. However, without incorporating any salary data into their regressions, Wilson and Ying's work suffered from the inability to distinguish between a team exhibiting

discriminatory hiring practices and a team simply hiring the best foreign talent. Pedace (2008) corrects for this discrepancy, incorporating an individual wage measure in a similar market test on nationality discrimination. Using data from the EPL from 1997 to 2002, Pedace reveals a similar shortage of players who are originally from South America. These players are paid a slight salary premium and, as a result, the increased presence of these players reduces overall team performance. Pedace suggests that while this event should not occur in efficient market equilibrium, it can be explained as a natural reaction on the part of team owners who observe increased attendance numbers from the presence of more South American players. However, while there is evidence of a slight bias towards South American players, Pedace finds limited evidence of nationality discrimination overall. This particular discrimination effect is surprising as the discrimination favors foreign players rather than domestic talent. Pedace offers the point that this may be the result of increased broadcast revenues that Premier League teams capture by televising matches in their foreign players' countries of origin. However, without readily available broadcast revenue data, this effect is difficult to quantify.

Although the NBA's labor market is nowhere near as saturated with foreign talent as that of the EPL, the recent influx of foreign talent into the league offers an ideal setting to apply a market test similar to Pedace's (2008) EPL study. His study raises a number of questions about the factors that could contribute to nationality discrimination in the NBA. For example, do foreign players such as China's Yi Jianlian, an average player based on his performance statistics, receive a salary premium relative to domestic players, or vice-versa? In the past, domestic prospects that have been successful in the American college or high school basketball systems seem to be preferred over foreign players who are often

considered unproven, high-risk draft picks and unlikely to adapt to the extreme competition and physical demands of the NBA. This would suggest that foreign players have been under-valued relative to their domestic peers and that teams could obtain the same level of success at a lower cost by acquiring foreign talent. However, the quality of many foreign professional basketball leagues has improved substantially in recent years, producing higher-quality players with significant professional basketball experience. As a result, foreign prospects have begun to attract more attention from NBA scouts and have increasingly infiltrated the more selective rounds of the NBA draft. This trend could be an indicator that foreign players are now being valued equally or even over-valued relative to domestic talent. If this is true, can this trend be explained by a player's ability to bring in additional ticket or broadcast revenue for the team or are teams simply responding to better performance? As Pedace points out in his study of the EPL, teams could capture additional broadcast revenues by televising matches in their foreign players' countries of origin, giving them a greater incentive to include foreign players on their team. Another issue to investigate is whether foreign players are more likely to sign with teams that are located in large metropolitan areas where there are more international and demographically diverse populations. If they are, do teams located in these large markets effectively boost their attendance and ticket revenues by acquiring more foreign talent?

Questions like these will be difficult to answer for a number of reasons. One potential problem is the constraints on the availability of financial data for both NBA franchises and player salaries. The availability of this data is critical to differentiating between the effect of a player's performance and that of his nationality/race

discrimination on his salary. Furthermore, there is the complicated matter of how to define owner utility. Most of the literature on the subject assumes the profit or revenue generated by the franchise is the main factor affecting owner utility. However, it is entirely possible that owners derive satisfaction from other team-related factors such as winning percentage, team popularity (attendance), or unrelated factors such as the chance to socialize with celebrities and other popular sports figures. Sloan (1971) was the first to suggest the concept of a hobbyist owner who derives satisfaction from factors other than profits and more recent evidence on owner behavior seems to confirm that owners do not always exhibit profit-maximizing behavior. A perfect example of this hobbyist owner is the Dallas Mavericks' owner, Mark Cuban, who spends exorbitant amounts of money on his franchise but seems to have no other motivation than winning an NBA championship and rubbing elbows with other famous people (Burdekin, forthcoming). Although this study will attempt to control for other team factors that could affect owner utility, this type of owner behavior is nearly impossible to control for and could affect the results accordingly.

III. Team Racial Composition and Player Performance

Annual data from the NBA seasons that were played during the 2005-2011 period reveals a substantial decline of white representation in the NBA, dropping from 24% in the 2005-2006 season to a level that is just below 21% in the 2010-2011 season (see Figure 1). Across the same time period, white representation of bench players has seen a similar trend, falling from 24% to just below 22%. Both of these results correspond to a

decline in the percentage of starters in the league who are white, which fell from 24% to under 19% during the sample period.

As indicated by Table 1, the distribution of white players and black players is quite uneven among the thirty NBA franchises. While the Orlando Magic and the Utah Jazz teams were both over 30% white during from 2005-2011, the New York Knicks and the Detroit Pistons were about 6% and 5% white, respectively. Data on total minutes played reflects a similar phenomenon, as the percentage of total minutes played by white players ranges from 38% for the Toronto Raptors to 5.1% for the Detroit Pistons. The wide variation in team racial composition is consistent with the hypothesis that fans prefer to watch players of their own race. However, there are many other factors, such as the race of available draft picks and free agents or the existing contractual obligations of teams that could explain the variation in the racial compositions of NBA teams.

Despite the varying levels of white representation on NBA teams, there is little evidence that inferior white players have replaced black players as a result of fan preferences for players of the same race. While the presence of white players in the league has fallen over the years, the performance levels of black players and white players have remained relatively similar. Table 2 compares the average performance of black players and white players using individual player statistics from the 2005-2006 season to the 2010-2011 season. The five performance statistics—assists, blocks, field goal percentage, points scored and total rebounds—have consistently been shown to affect salary (Berri 2003) and are used to examine starter performance and bench player performance separately.[1] *Starters* are defined as the top five players on each in team in minutes played per game, while *bench players* is made up of the remaining players. The

analysis indicates significant differences between average white player performance and black player performance in only four categories and there seems to be no consistent pattern for blacks to outperform whites, or vice-versa. On average, black starters score more points than white starters and black bench players outperform white bench players in assists. However, both white starters and white bench players outperform their black counterparts in total rebounds. In all other categories white players and black players are statistically equal.

IV. Team Composition by Foreign Players and Player Performance

Annual data from the same period from 2005-2011 indicates a slight increase in the representation of foreign players in the NBA, rising from 17.69% in the 2005-2006 season to 18.36% in the 2010-2011 season (see Figures 2 & 3).[2] Although the magnitude of this change seems relatively small, it only reflects a small part of the influx of foreign players into the league that has occurred in the new millennium. In comparison, consider that foreign players only constituted about 10% of total NBA players during the 1999-2000 season. Furthermore, the 2009-2010 season broke the NBA record for the most foreign player participation in league with a total of 83 foreign players on NBA roster. Breaking this trend down between foreign players who played college basketball in the U.S. and foreign players who went straight to the NBA reveals a slight increase in the representation of both groups. The college group jumps from 5.46% in 2005-2006 to 5.75% in 2010-2011 and the group that went straight to the pros moves from 12.23% to

12.61%. During the same time period, the level of foreign starters rose from 18.67% to 19.33%, but the percentage of foreign bench players remained relatively constant.

As indicated by Table 3, the distribution of foreign-born players and players born in the U.S. is quite uneven among the thirty NBA franchises. The San Antonio Spurs, Sacramento Kings, and the Oklahoma City Thunder teams were all over 30% foreign during the six NBA seasons from 2005-2011. Over the same period, the Denver Nuggets, Detroit Pistons, Indiana Pacers, Golden State Warriors, and Portland Trailblazers were all under 10% foreign. The distributions of foreign players who played college basketball, as well as those who went straight to the NBA, are equally as varied. San Antonio and Sacramento's teams saw more than 20% of their players come from the foreign-pro group while four teams had less than 5% of their players come from the same group. The Atlanta Hawks and Oklahoma City had the highest percentage of players from the foreign-college group with at least 15%, while nine teams had less than 2% of their players from the same group. Data on total minutes played (Table 4) reflects an even more varied distribution, as the percentage of a team's total minutes played by foreign players ranges from over 40% for San Antonio and Pheonix to less than 5% for Detroit, New York, Boston, and the Los Angeles Clippers. Differentiating between players who went straight to the pros and players that played in college reveals a similarly varied trend. Over 20% of San Antonio and Milwaukee's total minutes were played by the foreign-college group, while nine other teams devoted less than 1% of their minutes to the same group. At the same time, Toronto and San Antonio gave about 30% of their total playing time to the foreign-pro group while six teams gave the same group less than 3% of their minutes.

The wide variation in team composition related to foreign players reveals much about the unique player preferences of NBA teams. There are only a few teams that did not have at least 10 % of their team comprised of foreign players, indicating a league-wide increase in demand for foreign players. However, it is clear that a few teams, namely San Antonio, Sacramento, and Oklahoma City, stand out from the rest in their preference for foreign players. Despite their large share of foreign players, San Antonio is the only one of these teams to give its foreign players a large share of the team's playing time. Pheonix, Toronto, and Milwaukee, on the other hand, gave their foreign players a much higher proportion of team minutes despite having a much smaller percentage of foreign players on their team. This might imply that a team like Sacramento or Oklahoma City is much more likely to invest in a young, risky foreign prospect and that teams like Pheonix, Toronto, and Milwaukee are either more confident in their foreign players abilities or have made better selections when acquiring foreign talent. Admittedly, there could be many different reasons for the varying distributions of foreign players in the league. While the preferences of owners, general managers, coaches and fans would seem to be the most influential factors in a team's decision whether or not to acquire a foreign player, other influences such as draft order, free agent availability and existing contractual obligations could have a significant impact as well.

One possible explanation for the recent increase in the number of foreign players in the NBA recently is that the foreign players perform better in certain statistical categories than players born in the U.S. Table 5 compares the average performance of foreign players with the average performance of U.S. players using individual player statistics from the 2005-2006 season to the 2010-2011 season. Using the same dataset, it

also compares the average performance of foreign players who went straight to the NBA and the average performance of foreign players who played college basketball in the U.S. The analysis utilizes the same five performance statistics that were used to examine differences between the performance levels of black players and white players and differentiates between starter performance and bench player performance as well as player position. In the first set of results, the differences between the foreign-pro group's performance and the foreign-college group's performance were all statistically equal with the exception of one category. The t-statistic indicates that foreign players who did not play college basketball in the U.S. score more points on average than foreign players who did go to college. However, the result is only significant at the 10% level. The second set of results indicates significant differences between foreign player performance and U.S. player performance in eight out of ten categories. On average, U.S. starters score more points and assist more field goals than foreign starters. U.S. bench players also outperform foreign bench players in assists. However, both foreign starters and foreign bench players outperform their counterparts from the U.S. in total rebounds and blocks. Foreign starters also shoot a better field goal percentage than U.S. starters. In the two remaining categories, bench player points and field goal percentage, foreign players and U.S. players are statistically equal. Comparing foreign player performance to U.S. player performance by position produces much different results. Surprisingly, foreign guards outperform U.S. guards in every category with varying levels of significance. However, U.S. forwards and centers outperform foreign forwards and centers in field goal percentage and U.S. centers also outperform foreign centers in total rebounds. In all other categories foreign forwards and centers are statistically equal to U.S. players.

There are a few possible explanations for these differences in performance. First, 76% (367/479) of the foreign players in the league from 2005-2011 were either forwards or centers compared to 58% (1298/2249) of U.S. players. Because of their size and defensive responsibilities, forwards and centers generally record more blocks and rebounds than guards do. Forwards and centers also tend to attempt shots closer to the basket and generally shoot a higher field goal percentage because of this. Conversely, guards tend to record more points and assists than forwards and centers because of their role on offense.[3] As foreign players have a higher percentage of forwards and centers in the data sample, it follows logically that they would outperform U.S. players in blocks, rebounds and field goal percentage. At the same time, it makes sense that U.S. players would outperform foreign players in points and assists because 42% of the U.S. players used in the data sample are guards compared to 24% of foreign players. The comparison of the two groups by position confirms this, as foreign players only outperform U.S. players at the guard position and are statistically equal in all but a few categories at the forward and center positions. One possible implication of these results is that there is excess demand for foreign forwards and centers and a lack of demand for foreign guards relative to their abilities. If this is true, teams could take advantage of this market inefficiency and pay less for higher-quality guards if they are foreign. For the same reason, they could pay less for a U.S. forward or center and receive an equal, if not better, level of performance.

V. Individual Player Salaries - Race

The time period (2005-2011) that this study is based on has not been studied extensively as of yet and, as a result, no evidence of overall salary discrimination against race or nationality in the NBA currently exists. The most recent examinations of salary discrimination in the NBA are from the late 1980s and early 1990s. There is substantial evidence that white players in the NBA received a salary premium relative to black players during the 1980s (Brown, Spiro & Keenan, 1991; Kahn & Sheer, 1988; Koch & Vander Hill, 1988; Wallace, 1988), but the NBA seems to have changed dramatically since then. Bodvarsson & Bradstow (1999) suggest that earnings discrimination was no longer prevalent in the NBA during the 1990s. However, Bodvarsson & Partridge (2001), one of the only studies that considers how the fan base in a metro area may affect salaries for different racial groups, found evidence in two seasons (1985-1986 and 1990-1991) of a salary premium for black players in areas where the black population was higher. While their regressions of player salaries by race found no significant population effect, the chance that black and white salary levels could vary with the racial composition of their market area is still consistent with the customer-discrimination hypothesis.

This study uses an earnings analysis similar to that of Bodvarsson & Partridge (2001) to examine the relationship of race and player salaries in recent seasons. This involves using data from the five NBA seasons played between 2005 and 2010 in two separate regressions on the natural log of player salaries, estimating the effects of player race, team racial composition, and the racial composition of the team's metro-area. The regressions incorporate various individual performance and metro-area variables in order to control for their effects on player salaries:

EXPERIENCE	Total seasons played
FIELD GOAL PERCENTAGE	Field goal percentage (Field goals made / field goals attempted)
MINUTES PER GAME	Minutes played per game
GAMES PLAYED	Games in which a player recorded playing time
POINTS PER GAME	Points scored per game
CENTER	Dummy for centers (1 = center)
FORWARD	Dummy for forwards (1 = forward)
TOTAL REBOUNDS PER GAME	Total rebounds per game
ASSISTS PER GAME	Assists per game
STEALS PER GAME	Steals per game
BLOCKS PER GAME	Blocks per game
ATTENDANCE	Average home game attendance of season
% MSA WHITE	Percent of the metro-area population that is white
MSA POPULATION (LN)	Natural log of metro-area population
MSA PER CAPITA INCOME (LN)	Natural log of metro-area per capita income
TEAM WINNING %	Team winning percentage
TEAM RACE	Percent of team that is white
PLAYER RACE	Race of player (1=white)
TIME	(0-4) 1995=0; 2010=4
(% MSA WHITE) * (TEAM RACE)	Interaction between percent of metro area that is white and the percent of team that is white

The percentage of metro-area population that is white is used as a proxy for customer discrimination. While it is not a perfect measure, the racial composition of a team's metro-area and its fans should be highly correlated. By controlling for attendance, any additional impacts of customer discrimination from increased attendance should be picked up by its coefficient. An interaction term of metro-area racial composition multiplied by team racial composition is included in the wage regression to account for customer discrimination's interaction with team racial mix. If this variable has a positive relationship with salaries and is statistically significant, it would suggest that customer discrimination is still prevalent in NBA in the 2000s and has a significant effect on player's wages. In addition, a variable for time is included to control for overall changes

in salaries over time. One would expect the coefficient on time to be positive and significant, reflecting a general increase in player salaries over time.

Table 6 presents the regression results of two regressions. Column (1) includes all of the variables mentioned above without team racial composition and its interaction term with metro-area racial mix. The coefficient on race is statistically significant at the 1% level using a two-tailed t-test and shows that an equally qualified white player earned nearly 25% more than the corresponding black player from 2005-2010. [0.247 = exp(0.221)-1]. The control variables for experience, points per game, games played, forward, center and blocks per game all have the expected positive signs on their coefficients and are significant at the 1% level. Time exhibits the expected positive effect and is significant at the 5% level. Field goal percentage, total rebounds per game, and metro-area population surprisingly have negative coefficients, but field goal percentage is the only significant variable, and it is at the 10% level. Column (2) shows the results of the same regression except that team racial composition and its interaction term with metro-area racial mix are included this time. Their inclusion in the regression seems to have little effect on the magnitude and significance of the coefficients of most of the variables. The coefficient of race on salary is slightly higher than before and still significant at the 1% level, indicating that an equally qualified white player made 26% more than the corresponding black player during those five seasons [0.262 = exp(0.233)-1]. Surprisingly, team race has a negative coefficient, while the estimated effect of the interaction variable between team racial composition and metro-area composition on salaries is large and positive. However, neither of these variables' coefficients is significant at any level, providing little evidence of customer discrimination or a

population demographic effect. In addition, both models have a relatively low R-squared value of 15%, indicating that there are could be other, more significant factors that explain the variation in player salaries. These could include anything from player draft position, to the player preferences of owners, managers and coaches, to the quality of a player's negotiating agent. Inclusion of some of these variables into a regression on player salaries could generate a more accurate model and provide an opportunity for further analysis.

VI. Individual Player Salaries - Foreign

Using the same earnings equation analysis, this study also attempts to determine if there is a significant difference in player salaries between foreign players and players born in the U.S. This analysis also uses data from the five NBA seasons played between 2005 and 2010 in four separate regressions on the natural log of player salaries, separately estimating the effects that a player coming from a foreign country, a foreign player playing college basketball in the U.S., a foreign player going straight to the NBA, and a foreign player being white or black has on individual player salaries. The regressions control for the exact same individual performance and metro-area variables as the racial discrimination models but include a few additional independent variables:

EXPERIENCE	Total seasons played
FIELD GOAL PERCENTAGE	Field goal percentage (Field goals made / field goals attempted)
MINUTES PER GAME	Minutes played per game
GAMES PLAYED	Games in which a player recorded playing time
POINTS PER GAME	Points scored per game
CENTER	Dummy for centers (1 = center)

FORWARD	Dummy for forwards (1 = forward)
TOTAL REBOUNDS PER GAME	Total rebounds per game
ASSISTS PER GAME	Assists per game
STEALS PER GAME	Steals per game
BLOCKS PER GAME	Blocks per game
ATTENDANCE	Average home game attendance of season
% MSA WHITE	Percent of the metro-area population that is white
MSA POPULATION (LN)	Natural log of metro-area population
MSA PER CAPITA INCOME (LN)	Natural log of metro-area per capita income
TEAM WINNING %	Team winning percentage
PLAYER RACE	Race of player (1=white)
TIME	(0-4) 1995=0; 2010=4
FOREIGN	Dummy for foreign players (1=foreign)
FOREIGN COLLEGE	Dummy for foreign players who played college basketball in the U.S. (1 = foreign & played in college)
FOREIGN PRO	Dummy for foreign players who went straight to the NBA (1=foreign and went straight to the pros)
(PLAYER RACE) * (FOREIGN)	Interaction between race of player and a player being foreign

The coefficient on the dummy variable for a player being foreign should be negative and significant if there is indeed salary discrimination against foreign players. Similarly, a negative coefficient on the dummy variables for foreign college and foreign pro would indicate salary discrimination against those groups of players as well. These variables are intentionally run in separate regressions in order to avoid the problem of the dummy variable trap.[4] Finally, an interaction term between race and the foreign player dummy is run in a fourth regression to determine if the race of a foreign player has any effect on player salaries. A variable for time is again included in all the regressions to control for overall changes in salaries over time. One would expect time's coefficient to be positive and significant, reflecting a general increase in player salaries over time.

Table 7 presents the results of the four regressions. Column (1) includes all of the control variables mentioned above but the foreign dummy is the only test variable. The coefficient on the foreign dummy is surprisingly positive but it is not statistically significant at any level. The control variables for experience, points per game, games played, forward, center, blocks per game, and race all have the expected positive signs on their coefficients and are significant at the 1% level. Time exhibits the expected positive effect and is significant at the 5% level. Field goal percentage, total rebounds per game, and metro-area population surprisingly have negative coefficients, but field goal percentage is the only significant variable and it is at the 10% level. Column (2) shows the results of the same regression except that the foreign-college dummy is included instead of the foreign dummy this time. The substitution of this variable in the regression has little effect on the magnitude and significance of the coefficients on the control variables. The coefficient of the foreign-college variable is positive but it is also not statistically significant at any level. The results portrayed in Column (3) are from the same regression but with the foreign-pro dummy substituted for the foreign-college dummy. There is almost no difference between the coefficients and standard errors of the control variables in Column (2) and (3). The coefficient of the foreign-pro variable is positive but it is not statistically significant at any level. Column (4) shows the results of the same regression shown in Column (1) except that the interaction variable between player race and the foreign dummy is now included. Nearly all of the control variable's coefficients have the same magnitude and standard error as the previous regressions with the exception being a slight increase in the coefficient on player race. The foreign dummy variable has a coefficient that is large and positive but with a t-stat of 1.36, it is not

significant at any level. The interaction variable's coefficient is negative, indicating lower salaries for players who are both white and foreign. However, this effect is not significant at any level. While all of the test variables in these regressions have interesting coefficients, their lack of significance at any level means that cannot confirm or deny the presence of salary discrimination against foreign players. As each of the four regressions has an R-squared value of 15%, it seems quite likely that there are a number of other significant factors that explain the variation in player salaries. Any additional analysis would benefit immensely from identifying these variables and incorporating them into a regression on player salaries in order to get more accurate results.

VII. Determinants of the Racial Composition of NBA Teams

If an NBA team is reacting to customer discrimination in its market area, there should be a corresponding match between the racial composition of the team and the racial composition of its respective market. Using MSA-level Census data and NBA team data from 1995-2010, this study investigates the relationship between team racial composition and metro-area racial composition. To do so, team racial composition is measured using three different variables: the percentage of total players on a team who are white, the percentage of bench players on a team who are white, and the percentage of starters on a team who are white. If customer discrimination exists, there should be a positive relationship between these variables and the percentage of the population in team metro-areas that is white. Two additional control variables are incorporated into the regression to avoid omitted variable bias. First, the ratio of stadium capacity to total MSA

population is added to the regressions as an independent variable to account for differences in market size. Team racial composition should be more important for a team in a smaller market because these teams have fewer potential customers. Furthermore, a team with a large population relative to its stadium capacity will probably have a large number of attending fans who do not discriminate because these fans are more likely to be marginal demanders of seats than discriminatory fans. The stadium capacity to MSA population variable should account for this effect in the regression, and as a result, it is expected to have a positive coefficient. Second, a time-trend variable is included to control for changes in the racial composition of teams related to time.

Table 8 shows the results from three regressions, each with a different dependent variable measuring team racial composition. In the first regression, the percentage of MSA population that is white (POPWHITE) has a significant positive effect on the percentage of a team's players that are white (TWHITE) and is significant at the 5% level. In the second regression, the effect of POPWHITE on the percentage of team bench players who are white (BWHITE) is shown to be positive and even larger than the variables effect on TWHITE. In this case, POPWHITE is significant at the 1% level. It is not significant, however, in the regression on team racial composition of starters (SWHITE). The stadium capacity to MSA population variable has the predicted positive coefficient and is significant at the 1% level in the team and bench regressions but not in the starter regressions. The time variable, on the other hand, is only significant in the starter regression at the 5% level. These results suggest that customer discrimination based on race still exists for bench players and for teams as a whole but it has become irrelevant for starters. The lack of customer discrimination for starters causes the

magnitude of customer discrimination on the team as a whole to be slightly lower than that of the bench players but it still exists nonetheless. The disappearance of customer discrimination for starters implies that fans have become indifferent to the race of starting players and care more about other attributes such as performance or character.

VIII. Racial Matching and Gains in Attendance and Revenue

The majority of revenue that NBA franchises generate comes from television contracts and home-game ticket sales. However, the league requires teams to pool their television revenue together and share it among the other teams and the players. At the same time, the league allows teams to keep nearly all of the revenue that they make from home-game ticket sales. While the amount of revenue generated by television contracts has grown substantially in the last few years, it still has to be divided up among the teams and the players, making it so a large portion of team revenue still comes from sources that are specific to a team's market area.[5] If demand for a given team's tickets is highly dependent on the team racial profile, then the team manager, assuming he wants to maximize his team's profits, will attempt to generate more revenue by taking advantage of the racial preferences of the local market.

The impact of team racial composition on ticket revenue could have a number of different implications for the relevance of customer discrimination, according to Burdekin, Hossfeld and Smith (2005). This study uses a similar cross-sectional analysis to theirs and as a result, the implications for customer discrimination are the same. Under the assumption that white players and black player exhibit statistically equal performance

levels, there are two possible explanations if no relationship exists between team racial composition and ticket revenue. The first possibility is that fans are indifferent to race and ticket revenue is not affected by team race. The second possibility is that fans are not indifferent to race and markets, with the exception of random errors, are in equilibrium with respect to race. If there is a positive relationship between team racial composition and revenue, there are two different ways to interpret the results. First, black and white player performance levels are still equal in quality, but customers are not indifferent to race and demand more white players as a percentage of team racial composition than managers are able supply the team with. Second, customers are indifferent to race but players are distributed in such a way that the average performance quality of white players is positively correlated with the percentage of the team that is white.

Putting these four possible interpretations into the context of a cross-sectional analysis on team racial composition allows us to determine the specific effects that TWHITE and an interaction variable between TWHITE and POPWHITE is expected to have on team attendance and revenue. If teams engage in window dressing, hiring lower quality white players simply to give off the appearance that team racial composition matches that of the market area, and all markets have similar demand for white players, then the coefficient on TWHITE will be positive. At the same time, the interaction effect between TWHITE and POPWHITE will be positive only if demand for white players is higher in markets that have a higher percentage of white people in their population. An interaction variable between TWHITE and TIME is also included in the analysis to account for changes in these relationships over time.

Table 9 presents two different sets of regressions. The first set of regressions looks at the determinants of home-game revenue while the second set examines the determinants of home-game attendance. Control variables are included in all of the regressions for team winning percentage, number of competing major professional sports franchises (MLB, NFL,and NHL), stadium capacity, MSA average income, and MSA total population. With the exception of income (a negative coefficient in three out of the four regressions) and stadium capacity (negative coefficient in one out of four regressions), all of the control variables have the expected signs on their coefficients. However, winning percentage the only variable that is significant in all four of the regressions (1% level). Income, with its surprisingly negative coefficient, is significant in the regressions on team revenue at the 5% level but is not significant in the regressions on attendance. Stadium capacity is exactly the opposite, significant at the 1% level in the regressions on average attendance but not in the regressions on revenue. Population is significant in three out of the four regressions at both the 5% and 1 % significance levels. The time trend is positive in the regressions on revenue but negative in the attendance regressions and it is only significant (10% level) in one out of the four.

Model (1) measures the effect that TWHITE and its interaction with time (TWHITE*TIME) has on home-game revenue. The coefficient on TWHITE is negative while the coefficient on the interaction variable with time is positive. However, neither variable is significant at any level. Despite these variables lack of significance, their inclusion offers an interesting perspective of how revenue is affected by changes in team racial composition over time. TWHITE has a negative effect (-0.210) on revenue in the 1995-1996 season, implying that there was an excess supply of white players in relation

to supply and that white players were of lower average quality than black players. However, TWHITE had a positive impact on revenue (-0.210 + 4*0.098) in the 2009-2010 season, suggesting that fan demand for white players exceeds the supply and that teams with a higher percentage of white players have higher quality white players. However, as neither of these variables is significant at any level, they can neither verify nor dismiss these hypotheses.

Model (2) uses different measures of team racial composition, namely an interaction term between the percentage of white players on a team and the percentage of people who are white in the total MSA population (TWHITE*POPWHITE). This variable is expected to pick up the effect that matching team racial composition and metro-area racial composition has on team revenue. POPWHITE is included as a separate team but it is also interacted with TWHITE and TIME in a final interaction term to measure the matching effect on revenue over time. POPWHITE has a positive coefficient and is significant at the 5% level but the matching term's coefficient is surprisingly negative (significant at 10% level). The matching variable's interaction with TIME has a positive effect on revenue but it is not significant at any level. These results suggest that racial matching drives revenue down, an implication that is not consistent with any of the aforementioned hypotheses for customer discrimination.

The last two regressions are essentially the same as the first two, except that they use average home-game attendance as the dependent variable. In Model (3), TWHITE and its interaction with TIME have the same effect as in Model (1) but are not significant at any level, giving us no insights into the presence of customer discrimination. Model (4), in contrast to Model (2), has a positive coefficient on the matching interaction

variable and is significant at the 5% level. POPWHITE and the interaction with the time trends both have positive coefficients but are not significant at any level. The results of this final regression suggest that racial matching is still relevant and gives teams a corresponding attendance boost when they engage in it. Evaluating the results of all four regressions, the there is no conclusive evidence that customer discrimination has a significant impact on team revenue but it does have a significant positive effect on average attendance.

IX. Conclusions

Based on evidence from the 2000s, it is not clear whether fans of the NBA have become indifferent to race. The representation of white players in the league has fallen while the results of analysis on player performance imply that teams use the most qualified players regardless of whether they are black or white. However, this does not provide sufficient proof to conclude that fans do not care about race. Evidence from regressions on player salaries indicates that white players are paid a premium relative to black players of equal performance quality. Teams that are located in whiter areas still tend to have a higher percentage of white players on the team, particularly on their bench, and white players are still distributed among the teams in a non-random pattern. Correcting for other factors, matching team racial composition and team market composition positively boosts attendance but has no significant effect on revenue.

Evidence from the same period is also mixed on whether fans in the NBA are indifferent to nationality. The representation of foreign players has grown substantially

since the 1990s while an examination of player performance indicates higher demand for foreign players at the forward and center positions and lower demand at the guard position. There also seems to be a non-random sorting of foreign players among NBA teams as certain teams tend to acquire and use foreign players more than others. However, the analysis of player salaries provides no conclusive evidence of salary discrimination based on a player being born in a foreign country.

Notes

[1] Classifying players according to their player position does not alter the overall picture apparent in Table 2. Results are provided in a separate appendix that is available from Peter Meyer (e-mail: peter.meyer12@claremontmckenna.edu) upon request.

[2] For simplicity's sake, foreign players are defined as players born in a foreign country, while U.S. players are defined as players born in the U.S.

[3] The primary defensive responsibilities of forwards and centers are to guard the opposing team's post players and protect the area immediately around the basket. In contrast, a guard will spend most of his time on defense further away from the hoop, defending the guards of the opposing team. As a result, forwards and centers should be more likely to block shots and grab rebounds. On offense, the role of the guard is generally to be the primary ball-handler, either distributing the ball for other players to score or scoring himself. In contrast, forwards and centers set screens, fight for offensive rebounds and generally only shoot if they catch a pass close to the basket. As a result, guards should average more points and assists per game, while forwards and centers should have a higher field-goal percentage.

[4] Running a regression that includes both the foreign-college and foreign-pro dummy variables would cause perfect multicollinearity because the two variables will always sum to 1. This is called the dummy variable trap.

[5] The NBA's television contracts for the two seasons from 1988-1990 brought in $12.5 million per year. In comparison, the NBA's current eight year contract with ESPN/ABC and TNT runs through the 2015-16 season and is worth about $930 million per year (Source: insidehoops.com and usatoday.com)

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Table 1: Racial Composition of NBA Teams 1996-2011

Team	Percent White 1995-1996 to 2010-2011 Seasons	Percentage of Total Minutes Played By White Players 1995-1996 to 2010-2011 Seasons
Orlando Magic	36.8%	32.9%
Utah Jazz	32.6%	34.0%
Toronto Raptors	31.3%	38.0%
Indiana Pacers	30.5%	34.5%
Portland Trail Blazers	30.5%	22.6%
LA Lakers	30.3%	26.0%
Milwaukee Bucks	27.4%	26.7%
San Antonio Spurs	27.1%	24.6%
Memphis Grizzlies	26.1%	24.6%
Cleveland Cavaliers	25.9%	24.7%
Golden State Warriors	25.6%	20.1%
Phoenix Suns	25.6%	22.0%
Houston Rockets	25.3%	23.9%
New Orleans Hornets	24.7%	14.5%
Minnesota Timberwolves	24.7%	20.8%
Philadelphia Sixers	24.5%	13.1%
Oklahoma City Thunder	23.9%	23.6%
New Jersey Nets	22.8%	28.2%
Chicago Bulls	21.1%	22.4%
Dallas Mavericks	18.8%	25.7%
Denver Nuggets	17.9%	15.1%
LA Clippers	17.7%	16.2%
Sacramento Kings	17.4%	25.7%
Atlanta Hawks	16.3%	10.4%
Washington Wizards	15.3%	9.1%
Charlotte Bobcats	15.2%	14.3%
Miami Heat	12.9%	13.1%
Boston Celtics	11.1%	8.5%
New York Knicks	6.3%	12.6%
Detroit Pistons	4.6%	5.1%
League Average	22.3%	21.1%

NOTE: Column 1 shows, by NBA team, the mean percentage of players on the team's roster who are white, averaged over six seasons (2005-2006 through 2010-2011). Column 2 shows the percentage of total

minutes played by white players for all games played during the same six seasons. Data are from the ESPN and NBA websites (see www.espn.com and www.nba.com)

Table 2: Performance Statistics for NBA Starters and Bench Players by Race

	Mean Performance Measure		
1. Starters	Black Players	White Players	T-Test of Difference of Means
Assists	0.097	0.099	-0.433
Blocks	0.019	0.022	-1.409
Field-Goal Percentage	0.462	0.469	-1.137
Points	0.456	0.428	2.024**
Rebounds	0.165	0.196	-3.908***
	Mean Performance Measure		
2. Bench Players	Black Players	White Players	T-Test of Difference of Means
Assists	0.071	0.061	2.972***
Blocks	0.020	0.022	-1.678*
Field-Goal Percentage	0.429	0.432	-0.462
Points	0.317	0.323	-0.990
Rebounds	0.165	0.195	-4.610***

NOTE: This table shows the mean values of five key performance measures averaged over six seasons (2005-2006 through 2010-2011) that the player played as a starter or bench player, respectively. A player is classified as a starter if he is on the team's roster but it is not one of the five players on the team who played the most total minutes over the course of the season. Except for field goal percentage, all performance measures are standardized by total minutes played during the season. Data are from the NBA Web site (see www.nba.com).

In section 1, total sample size equals 900 (188 starters who are white and 712 starters who are black). In section 2, total sample size equals 1804 (416 bench players who are white and 1388 who are black).

*Significant at the .01 level, two-tailed test.

**Significant at the .05 level, two-tailed test.

*** Significant at the .10 level, two-tailed test.

Table 3: Percentage of Foreign-born Players on NBA Teams 1996-2011

Team	Percent Foreign who went straight to the NBA	Percent Foreign who attended college in the US	Total Percent Foreign
San Antonio Spurs	26.32%	8.42%	34.74%
Sacramento Kings	23.16%	8.42%	31.58%
Oklahoma City Thunder	15.12%	15.12%	30.23%
Atlanta Hawks	8.79%	19.78%	28.57%
Washington Wizards	17.24%	9.20%	26.44%
Dallas Mavericks	18.48%	6.52%	25.00%
Cleveland Cavaliers	19.05%	5.95%	25.00%
Utah Jazz	17.39%	3.26%	20.65%
Miami Heat	14.44%	5.56%	20.00%
New York Knicks	16.47%	3.53%	20.00%
LA Lakers	9.68%	9.68%	19.35%
Orlando Magic	19.10%	0.00%	19.10%
LA Clippers	11.76%	7.06%	18.82%
Milwaukee Bucks	15.38%	3.30%	18.68%
New Jersey Nets	8.79%	9.89%	18.68%
Toronto Raptors	15.22%	3.26%	18.48%
Phoenix Suns	16.67%	1.11%	17.78%
New Orleans Hornets	11.90%	4.76%	16.67%
Boston Celtics	12.22%	4.44%	16.67%
Philadelphia Sixers	13.64%	1.14%	14.77%
Minnesota Timberwolves	10.20%	4.08%	14.29%
Houston Rockets	4.26%	8.51%	12.77%
Chicago Bulls	2.11%	10.53%	12.63%
Charlotte Bobcats	10.84%	0.00%	10.84%
Memphis Grizzlies	1.14%	9.09%	10.23%
Denver Nuggets	7.06%	0.00%	7.06%
Detroit Pistons	6.45%	0.00%	6.45%
Indiana Pacers	5.32%	1.06%	6.38%
Golden State Warriors	5.10%	1.02%	6.12%
Portland Trail Blazers	3.49%	1.16%	4.65%
League Average	12.2%	5.5%	17.8%

NOTE: Column 1 shows, by NBA team, the mean percentage of players on the team's roster who are foreign-born and went straight to NBA, averaged over six seasons (2005-2006 through 2010-2011). Column 2 shows the mean percentage of players on the team's roster who are foreign-born and played college basketball in the U.S. Column 3 shows the mean percentage of all players on the team's roster who are foreign-born. Data are from the ESPN and NBA websites (see www.espn.com and www.nba.com)

Table 4: Percentage of Minutes played by Foreign-born Players on NBA Teams 1996-2011

Team	Percentage of Total Minutes Played By Foreign Players who went straight to the NBA	Percentage of Total Minutes Played By Foreign Players who attended college in the US	Percentage of Total Minutes Played By Foreign Players
San Antonio Spurs	28.37%	14.44%	42.81%
Phoenix Suns	18.71%	21.35%	40.07%
Toronto Raptors	31.23%	3.73%	34.96%
Milwaukee Bucks	8.41%	22.04%	30.45%
Utah Jazz	22.38%	3.16%	25.55%
Golden State Warriors	16.12%	8.36%	24.48%
Sacramento Kings	14.67%	9.14%	23.81%
Dallas Mavericks	19.28%	3.55%	22.82%
Chicago Bulls	7.51%	13.60%	21.11%
Cleveland Cavaliers	20.69%	0.00%	20.69%
LA Lakers	17.41%	2.17%	19.59%
Orlando Magic	16.04%	3.16%	19.21%
Memphis Grizzlies	16.20%	1.72%	17.93%
Houston Rockets	17.02%	0.78%	17.80%
Atlanta Hawks	8.29%	8.64%	16.93%
Oklahoma City Thunder	16.19%	0.72%	16.91%
Denver Nuggets	11.04%	5.74%	16.78%
New Jersey Nets	14.38%	2.07%	16.45%
Portland Trail Blazers	12.47%	2.38%	14.84%
Charlotte Bobcats	10.03%	4.57%	14.60%
Washington Wizards	2.09%	9.78%	11.87%
New Orleans Hornets	9.34%	2.17%	11.51%
Philadelphia Sixers	0.79%	9.60%	10.39%
Minnesota Timberwolves	9.37%	0.00%	9.37%
Miami Heat	1.08%	6.75%	7.83%
Indiana Pacers	6.66%	0.00%	6.66%
Detroit Pistons	4.53%	0.00%	4.53%
New York Knicks	2.82%	1.01%	3.83%
Boston Celtics	2.87%	0.93%	3.80%
LA Clippers	0.68%	0.02%	0.70%
League Average	12.2%	5.4%	17.6%

NOTE: Column 1 shows, by NBA team, the percentage of total minutes played by foreign-born players who went straight to the NBA for all games played six seasons (2005-2006 through 2010-2011). Column 2 shows the percentage of total minutes played by foreign-born players who played college basketball in the U.S. for all games played during the same six seasons. Column 3 shows the percentage of total minutes played by all foreign-born players during the same six seasons. Data are from the ESPN and NBA websites (see www.espn.com and www.nba.com)

Table 5: Foreign vs. US Performance Statistics for Starters, Bench Players, and Various Positions

	Mean Performance Measure		
1. Starters	Foreign Players-Pro	Foreign Players-College	T-Test of Difference of Means
Assists	0.102	0.095	0.450
Blocks	0.027	0.030	-0.599
Field-Goal Percentage	0.489	0.491	-0.104
Points	0.439	0.410	1.831*
Rebounds	0.186	0.212	-1.436
2. Bench Players	Foreign Players-Pro	Foreign Players-College	T-Test of Difference of Means
Assists	0.052	0.055	-0.399
Blocks	0.031	0.029	0.417
Field-Goal Percentage	0.417	0.428	-0.625
Points	0.309	0.289	1.437
Rebounds	0.198	0.197	0.101
3. Starters	Foreign Players-Total	U.S. Players	T-Test of Difference of Means
Assists	0.077	0.103	-4.893***
Blocks	0.027	0.016	6.039***
Field-Goal Percentage	0.477	0.455	4.291***
Points	0.390	0.460	-6.265***
Rebounds	0.196	0.157	5.643***
4. Bench Players	Foreign Players-Total	U.S. Players	T-Test of Difference of Means
Assists	0.056	0.069	-3.529***
Blocks	0.029	0.019	5.136***
Field-Goal Percentage	0.432	0.425	0.750
Points	0.316	0.313	0.420
Rebounds	0.196	0.164	4.995***
5. Guards	Foreign Players-Total	U.S. Players	T-Test of Difference of Means
Assists	0.131	0.116	1.772*
Blocks	0.009	0.007	1.877*
Field-Goal Percentage	0.439	0.410	3.301***
Points	0.407	0.377	2.077**
Rebounds	0.107	0.099	2.131**
N	112	951	
6. Forwards	Foreign Players-Total	U.S. Players	T-Test of Difference of Means
Assists	0.063	0.058	1.356
Blocks	0.023	0.021	0.942
Field-Goal Percentage	0.425	0.452	-2.459**
Points	0.369	0.382	-0.851
Rebounds	0.188	0.197	-1.221
7. Centers	Foreign Players-Total	U.S. Players	T-Test of Difference of Means
Assists	0.044	0.040	1.502
Blocks	0.039	0.042	-1.239
Field-Goal Percentage	0.468	0.493	-2.464***
Points	0.333	0.333	0.006
Rebounds	0.239	0.261	-3.068***

NOTE: This table shows the mean values of five key performance measures averaged over six seasons (2005-2006 through 2010-2011) that the player played as a starter or bench player, respectively. A player is classified as a starter if he is on the team's roster but it is not one of the five players on the team who played the most total minutes over the course of the season. Except for field goal percentage, all performance measures are standardized by total minutes played during the season. Data are from the NBA Web site (see www.nba.com).

*Significant at the .01 level; **Significant at the .05 level; *** Significant at the .10 level, two-tailed test.

Table 6: Models of Individual Player Salaries with Race Variables

	Dependent Variable: Natural log of salary	
	Model (1)	Model (2)
Explanatory Variables	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)
Experience	0.063*** (0.007)	0.063*** (0.007)
Field Goal Percentage	-0.481* (0.285)	-0.482* (0.285)
Minutes per Game	0.006 (0.008)	0.006 (0.008)
Points per Game	0.026*** (0.009)	0.026*** (0.009)
Games Played	0.004*** (0.002)	0.004*** (0.002)
Forward	0.197*** (0.066)	0.194*** (0.066)
Center	0.345*** (0.091)	0.341*** (0.091)
Total Reb. per Game	-0.025 (0.022)	-0.025 (0.022)
Assists per Game	0.014 (0.023)	0.015 (0.023)
Steals per Game	0.115 (0.100)	0.115 (0.100)
Blocks per Game	0.216*** (0.076)	0.216*** (0.076)
Avg. Attendance	2.67e-06 (.000015)	1.14e-06 (.000015)
% white of MSA Population	0.294 (0.272)	0.135 (0.660)
MSA population (ln)	-0.006 (0.045)	-0.011 (0.045)
MSA per cap. income (ln)	0.201 (0.193)	0.162 (0.200)
Winning %	0.154 (0.197)	0.154 (0.200)
Player Race (1 = white)	0.221*** (0.057)	0.233*** (0.059)
Time	0.041** (.018)	0.041** (.018)
Team Race (% White)		-0.779 (1.676)
(MSA White Pop)*(Team Race)		0.782 (2.428)
CONSTANT	11.173 (2.080)	11.865 (2.187)
Adj. R^2	0.15	0.15
N	2238	2238

Note: These models show the natural log of individual player salaries as a function of explanatory variables, including the variables describing the racial composition of the team. The results are based on 2238 observations over five NBA seasons (2005-2010). Individual player salary data is from Draft Express (see www.draftexpress.com). Individual and Team performance data, including attendance, is from the ESPN and NBA websites (see www.espn.com and www.nba.com). Income, population and demographic data for MSAs are from the U.S. Bureau of the Census and for Toronto, Statistics Canada (see www.statcan.gc.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).
*Significant at the .01 level; **Significant at the .05 level; *** Significant at the .10 level, two-tailed test.

Table 7: Models of Individual Player Salaries with Foreign Player Variables

	Dependent Variable: Natural log of salary			
	Model (1)	Model (2)	Model (3)	Model (4)
Explanatory Variables	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)
Experience	0.063*** (0.007)	0.063*** (0.007)	0.063*** (0.007)	0.063*** (0.007)
Field Goal Percentage	-0.474* (0.285)	-0.475* (0.285)	-0.478* (0.285)	-0.482* (0.285)
Minutes per Game	0.006 (0.008)	0.006 (0.008)	0.006 (0.008)	0.005 (0.008)
Points per Game	0.026*** (0.009)	0.026*** (0.009)	0.026*** (0.009)	0.027*** (0.009)
Games Played	0.004*** (0.002)	0.004*** (0.002)	0.004*** (0.002)	0.004*** (0.002)
Forward	0.195*** (0.066)	0.197*** (0.066)	0.196*** (0.066)	0.197*** (0.066)
Center	0.339*** (0.091)	0.341*** (0.091)	0.344*** (0.091)	0.338*** (0.091)
Total Reb. per Game	-0.025 (0.022)	-0.025 (0.022)	-0.025 (0.022)	-0.024 (0.022)
Assists per Game	0.014 (0.023)	0.014 (0.023)	0.015 (0.023)	0.014 (0.023)
Steals per Game	0.118 (0.100)	0.119 (0.100)	0.115 (0.100)	0.122(0.100)
Blocks per Game	0.213*** (0.076)	0.214*** (0.076)	0.215*** (0.076)	0.209*** (0.076)
Avg. Attendance	2.48e-06 (.000015)	2.68e-06 (.000015)	2.60e-06 (.000015)	3.29e-06 (.000015)
%white of MSA Population	0.299 (0.272)	0.293 (0.272)	0.296 (0.272)	0.279 (0.272)
MSA population (ln)	-0.006 (0.045)	-0.006 (0.045)	-0.006 (0.045)	-0.008 (0.045)
MSA per cap. income (ln)	0.205 (0.193)	0.202 (0.193)	0.204 (0.193)	0.197 (0.193)
Winning %	0.154 (0.197)	0.152 (0.200)	0.152 (0.198)	0.139 (0.198)
Player Race (1 = white)	0.208*** (0.062)	0.219*** (0.059)	0.219*** (0.063)	0.256*** (0.063)
Time	0.041** (.018)	0.041** (.018)	0.041** (.018)	0.041** (.018)
Foreign	0.035 (.064)			0.117 (0.086)
Foreign College(1=foreign and played college basketball in U.S.)		0.057 (.093)		
Foreign Pro(1=foreign and did not play college basketball in U.S.)			0.012 (.075)	
(Race)*(Foreign)				-0.164 (0.126)
CONSTANT	11.142 (2.078)	11.179 (2.080)	11.160(2.079)	11.265 (2.078)
Adj. R^2	0.15	0.15	0.15	0.15
N	2238	2238	2238	2238

Note: These models show the natural log of individual player salaries as a function of explanatory variables, including the variables describing the composition of the team by foreign players. The results are based on 2238 observations over five NBA seasons (2005-2010). Individual player salary data is from Draft Express (see www.draftexpress.com). Individual and Team performance data, including attendance, is from the ESPN and NBA websites (see www.espn.com and www.nba.com). Income, population and demographic data for MSAs are from the U.S. Bureau of the Census and for Toronto, Statistics Canada (see www.statcan.gc.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).
*Significant at the .01 level; **Significant at the .05 level; *** Significant at the .10 level, two-tailed test.

Table 8: Models of Racial Composition of NBA Teams

	Percentage of Team White (TWHITE) %	Percentage of Bench White (BWHITE) %	Percentage of Starters White (SWHITE) %
Explanatory Variables	Coefficient (t statistic)	Coefficient (t statistic)	Coefficient (t statistic)
POPWHITE: Percentage White of SMSA Population(%)	0.207** (2.63)	0.284*** (2.81)	0.041 (0.34)
STADIUMCAP/POP: Stadium Capacity/ Metro Population	4.687*** (3.30)	5.625*** (2.97)	2.499 (1.07)
TIME (0-5)	-0.004 (-0.98)	0.0007 (0.14)	-0.014** (-2.01)
CONSTANT	0.061 (1.16)	0.0014 (0.02)	0.194 (2.47)
Adj. R^2	0.11	0.10	0.03

Note: The dependent variables in the models are (a) percentage of the team members who are white, (b) percentage of bench players who are white, and (c) percentage of the starters who are white. The t-tests are based on robust standard errors. The results are based on 150 observations during five seasons (1995-2010). Data on teams are from the ESPN and NBA websites (see www.espn.com and www.nba.com). Population is total MSA population from the U.S. Bureau of the Census and for Toronto, Statistics Canada (see www.statcan.gc.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).
*Significant at the .01 level; **Significant at the .05 level; *** Significant at the .10 level, two-tailed test.

Table 9: Team Home-Game Revenues and Home-Game Attendance

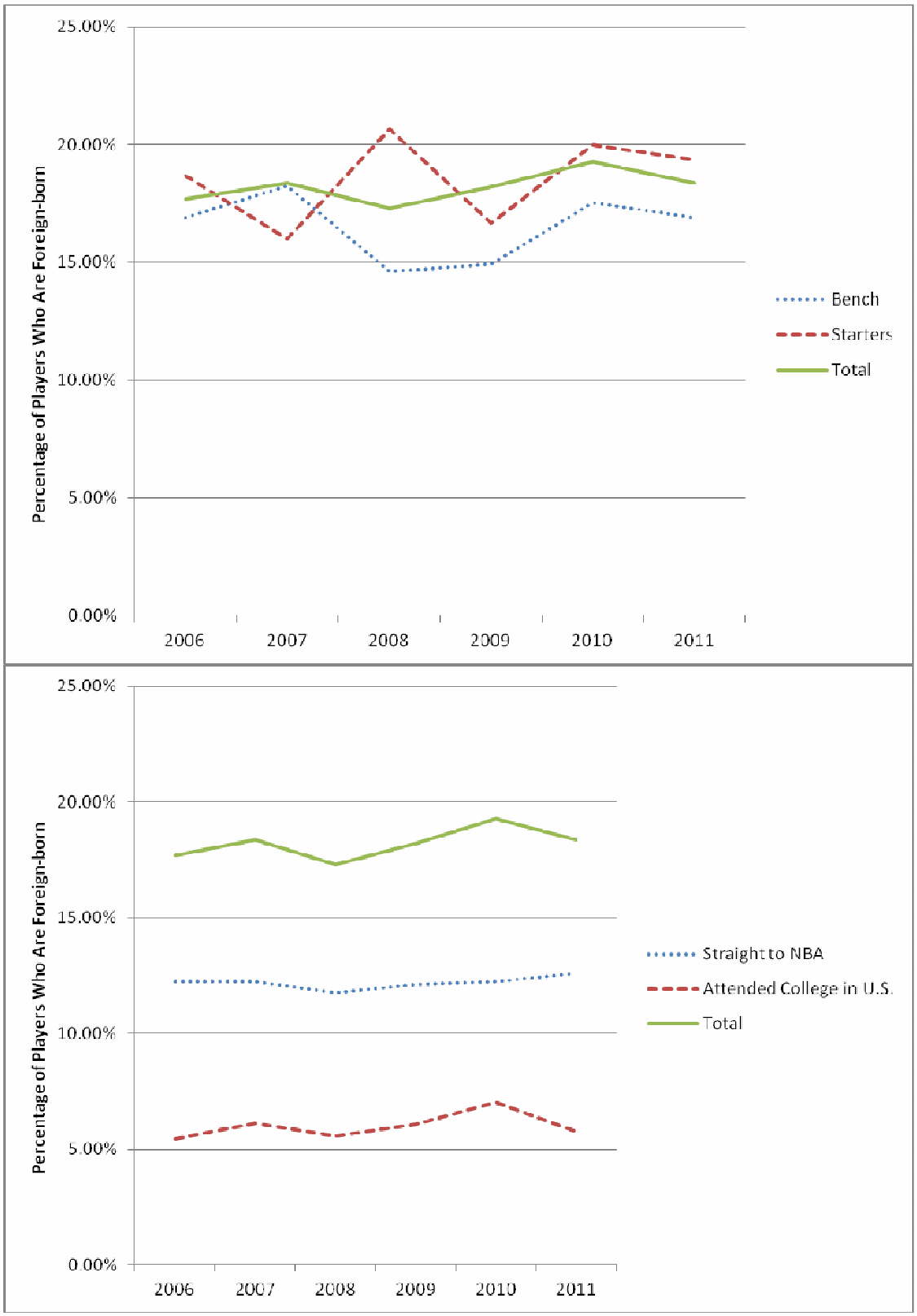
	Dependent Variable: Home Game Revenues	
	Model (1)	Model (2)
Explanatory Variables	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)
WINPER: Team winning percentage	0.585*** (0.086)	0.540*** (0.086)
COMPETITORS: Number of competing professional sports franchises in the city	0.021* (0.013)	0.0204 (0.013)
STADIUMCAP: Stadium capacity (ln)	-0.011 (0.137)	0.107 (0.149)
Income (ln)	-0.268** (0.108)	-0.236** (0.102)
POP: Total SMSA population (ln)	0.189 (0.150)	0.321** (0.159)
TIME: Time trend (2006=0)	0.008 (0.248)	0.010 (0.226)
TWHITE: Percentage of team white	-0.210 (0.208)	1.129 (0.845)
TWHITE*TIME	0.098 (0.089)	
POPWHITE: Percentage white of SMSA population		0.708** (0.332)
TWHITE*POPWHITE		-1.952* (0.112)
TWHITE*POPWHITE*TIME		0.127 (0.112)
CONSTANT	11.302	9.129
Adj. R^2	0.58	0.60

	Dependent Variable: Average Home Game Attendance	
	Model (3)	Model (4)
Explanatory Variables	Coefficient (Robust Std. Error)	Coefficient (Robust Std. Error)
WINPER: Team winning percentage	0.448*** (0.055)	0.426*** (0.054)
COMPETITORS: Number of competing professional sports franchises in the city	0.031 (0.006)	0.006 (0.005)
STADIUMCAP: Stadium capacity (ln)	0.272*** (0.102)	0.362*** (0.101)
Income (ln)	-0.014 (0.074)	.019 (0.073)
POP: Total SMSA population (ln)	0.346*** (0.104)	0.445*** (0.103)
TIME: Time trend (2006=0)	-0.015(0.011)	-0.018* (0.010)
TWHITE: Percentage of team white	-0.060 (0.102)	-0.905** (0.417)
TWHITE*TIME	0.034 (0.044)	
POPWHITE: Percentage white of SMSA population		0.051 (0.183)
TWHITE*POPWHITE		1.177** (0.637)
TWHITE*POPWHITE*TIME		0.067 (0.058)
CONSTANT	5.89	4.5
Adj. R^2	0.48	0.56

Note: These models show the natural log of home game revenue ($000), as a function of explanatory variables, including the variables describing the racial composition of the team. The results are based on 150 observations over five NBA seasons (2005-2010). Team revenue data is based on estimates that were published by Forbes in 2010 (see www.forbes.com and search for basketball valuations). Other team data, including attendance, is from the ESPN and NBA websites (see www.espn.com and www.nba.com). Income, population and demographic data for MSAs are from the U.S. Bureau of the Census and for Toronto, Statistics Canada (see www.statcan.gc.ca) and the Canadian Ministry of Finance (see www.bcstats.gov.bc.ca).

*Significant at the .01 level; **Significant at the .05 level; *** Significant at the .10 level, two-tailed test.

Figure 1: Average Racial Composition of NBA Teams over Time



Figures 2 & 3: Average Composition of NBA Teams by Foreign Players over Time